

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Britt T. McKinney
S&E Vice President

OCT 16 2003

WO 03-0061

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Docket No. 50-482: Licensee Event Report 2003-003-00, Reactor
Protection System Actuation and Reactor Trip due to Feedwater Isolation
Valve Closure

Gentlemen:

The enclosed Licensee Event Report (LER) 2003-003-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding an Engineered Safety Features Actuation and Reactor Trip at Wolf Creek Generating Station.

Wolf Creek Nuclear Operating Corporation has made no commitments in the enclosed LER.

If you should have any questions regarding this submittal, please contact me at (620) 364-4112 or Mr. Kevin Moles at (620) 364-4126.

Sincerely,



Britt T. McKinney

BTM/rig

Enclosure

cc: J. N. Donohew (NRC), w/e
D. N. Graves (NRC), w/e
B. S. Mallett (NRC), w/e
Senior Resident Inspector (NRC), w/e

JEZZ

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 ES), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to bjr1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE08-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

| | | |
|---|------------------------------|-------------------|
| 1. FACILITY NAME WOLF CREEK GENERATING STATION | 2. DOCKET NUMBER 05000482 | 3. PAGE 1 OF 4 |
|---|------------------------------|-------------------|

4. TITLE
REACTOR PROTECTION SYSTEM ACTUATION AND REACTOR TRIP DUE TO FEEDWATER ISOLATION VALVE CLOSURE

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---------------|-----|------|---------------|-------------------|--------|----------------|-----|------|------------------------------|---------------|
| MO | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO | MO | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 08 | 18 | 2003 | 2003 | 003 | 00 | 10 | 16 | 2003 | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | | 05000 |
| | | | | | | | | | | 05000 |

| | | | | | | | | | | |
|------------------------|---|--------------------|---------------------|---|--|--|--|--|--|--|
| 9. OPERATING MODE 1 | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) | | | | | | | | | |
| 10. POWER LEVEL 100 | 20.2201(b) | 20.2203(a)(3)(ii) | 50.73(a)(2)(ii)(B) | 50.73(a)(2)(x)(A) | | | | | | |
| | 20.2201(d) | 20.2203(a)(4) | 50.73(a)(2)(iii) | 50.73(a)(2)(x) | | | | | | |
| | 20.2203(a)(1) | 50.38(c)(1)(ii)(A) | ✓ 50.73(a)(2)(v)(A) | 73.71(a)(4) | | | | | | |
| | 20.2203(a)(2)(i) | 50.38(c)(1)(ii)(A) | 50.73(a)(2)(v)(A) | 73.71(a)(5) | | | | | | |
| | 20.2203(a)(2)(ii) | 50.38(c)(2) | 50.73(a)(2)(v)(B) | OTHER | | | | | | |
| | 20.2203(a)(2)(iii) | 50.46(a)(3)(ii) | 50.73(a)(2)(v)(C) | Specify in Abstract below or in NRC Form 366A | | | | | | |
| | 20.2203(a)(2)(iv) | 50.73(a)(2)(i)(A) | 50.73(a)(2)(v)(D) | | | | | | | |
| | 20.2203(a)(2)(v) | 50.73(a)(2)(i)(B) | 50.73(a)(2)(vi) | | | | | | | |
| | 20.2203(a)(2)(vi) | 50.73(a)(2)(i)(C) | 50.73(a)(2)(vii)(A) | | | | | | | |
| | 20.2203(a)(3)(i) | 50.73(a)(2)(ii)(A) | 50.73(a)(2)(vii)(B) | | | | | | | |

| | |
|--|--|
| 12. LICENSEE CONTACT FOR THIS LER | |
| NAME Kevin J. Moles, Manager Regulatory Affairs | TELEPHONE NUMBER (Include Area Code) (620) 364-4126 |

| 13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT | | | | | | | | | |
|---|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
| X | JE | IMOD | C560 | Yes | X | SJ | ISV | A391 | YES |

| | | | | | | |
|---|--|--|--|------------------------------|----|--|
| 14. SUPPLEMENTAL REPORT EXPECTED | | | | 15. EXPECTED SUBMISSION DATE | | |
| YES (If yes, complete EXPECTED SUBMISSION DATE) | | | | ✓ | NO | |
| | | | | | | |

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On August 18, 2003, at 3:54 PM, Wolf Creek experienced an automatic actuation of the Reactor Protection System (RPS) including an automatic reactor trip due to lo/lo water level in "B" steam generator (SG). This actuation occurred following the closure of the "B" SG main feedwater isolation valve (FWIV). When the FWIV closed, "B" SG level decreased below the reactor trip setpoint, initiating a reactor trip. The unit received an expected feedwater isolation and expected auxiliary feedwater actuation (both motor and turbine driven) because of the lo/lo SG level. All control rods fully inserted, and the RPS and Engineered Safety Features (ESF) performed as expected.

The cause of the FWIV closure was a spurious signal from the Engineered Safety Features Actuation System for the "B" SG. The specific component failure could not be determined so all of the electrical components that could have caused the fast closure of the "B" FWIV were replaced.

The safety significance of this event is low. This event is bounded by the current licensing basis analyses as reported in Wolf Creek Generating Station Updated Safety Analysis Report (USAR) section 15.2.7 "Loss of Normal Feedwater Flow." All safety related equipment performed as expected. There were no adverse effects on the health and safety of the public.

LICENSEE EVENT REPORT (LER)

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| | | 2003 | - 003 | - 00 | |

17. NARRATIVE (If more space is required, use additional copies of NRC Form 365A)

Background:

Steam Generator (SG) [EIS Code: SG] water level is controlled by the position of the Main Feedwater System [EIS Code: SJ] Isolation Valve (FWIV). If the FWIV closes during power operation the water level in the steam generator affected will decrease. When a lo/lo level trip condition exists a reactor trip occurs.

Control and actuation signals for the FWIV's come from the Engineered Safety Features Actuation System (ESFAS), [EIS Code: JE]. The ESFAS is comprised of the instrumentation and controls to detect parameters consistent with accident situations and initiate the operation of necessary Engineered Safety Features (ESF).

Plant Conditions Prior to the Event:

MODE - 1

Power - 100%

Normal Operating Temperature and Pressure

Event Description:

On August 18, 2003, Wolf Creek Generating Station (WCGS) was operating at 100 percent steady state power. At 15:54 the Steam Generator "B" FWIV, AEFV-040, fast-closed to the fully shut position isolating the Main Feedwater supply to Steam Generator "B". This caused a rapid lowering of water level in the steam generator that initiated a reactor trip on lo/lo level.

At the time of the trip, all control rods fully inserted and all safety equipment performed as designed. Main feedwater isolated and motor-driven and turbine-driven auxiliary feedwater pumps started as expected. The source range nuclear instrumentation was energized and the plant entered Mode 3. There were no significant maintenance or operating evolutions in progress at the time of the trip, nor were there any major pieces of equipment out of service.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Basis for Reportability:

The reactor trip and subsequent actuation of ESF Systems described in this event is reportable per 10 CFR 50.73 (a)(2)(iv)(A), which requires reporting of "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." Paragraph (B)(1) of 10 CFR 50.73(a)(2)(iv) includes "Reactor protection System (RPS) including: reactor scram or trip."

Root Cause:

All potential mechanical and human error factors were examined and refuted. The investigation of this event then focused on the electrical control and actuation components and circuitry. The failure that initiated closure of the "B" SG FWIV and subsequent reactor trip has been attributed to an intermittent failure within these control and actuation components and their associated circuitry.

Corrective actions:

Because this failure could not be isolated to a single component, all of the electrical control components that could have caused the fast closure of the "B" SG FWIV were replaced. Post maintenance and surveillance testing of "B" SG FWIV operation was completed by 18:56 on August 19, 2003.

Safety Significance:

The safety significance of this event is low. This event is bounded by the current licensing basis analysis as reported in Wolf Creek Generating Station Updated Safety Analysis Report (USAR) section 15.2.7 "Loss of Normal Feedwater Flow." The event reduced normal feedwater flow to the "B" SG, resulting in the reduction of level in the secondary side of the SG. The reduction in SG level provided the input (lo/lo SG Level Signal) to trip the reactor, isolate all normal feedwater, and start the motor driven auxiliary feedwater pumps. The turbine driven auxiliary feedwater pump started as expected as a result of SG lo/lo levels following feedwater isolation. There were no adverse effects on the reactor core, the reactor coolant system, or the main steam system, due to the auxiliary feedwater system's capacity to supply the necessary heat sink.

All safety related equipment performed as designed and there were no adverse effects on the health and safety of the public.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Operating Experience/Previous Events:

The type of ESFAS equipment that caused this event is unique to Wolf Creek and Callaway, so the review of Operating Experience was limited to these two plants. This review found that there was one previous failure of an ESFAS card that had resulted in the inadvertent closure of a FWIV. In May, 1992, at Callaway, an ESFAS relay driver card inadvertently energized its associated output relay that led to the fast closure of "C" SG FWIV, AEFV41. The specific failure could not be duplicated and the card was replaced.

No similar events where FWIVs operated on inadvertent ESFAS signals were identified at Wolf Creek.